I. INTRODUCTION

INTRODUCTION

What is nonpoint source (NPS) pollution and why does it need to be assessed or managed?

"Nonpoint source pollution occurs when rainfall, snowmelt, or irrigation runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes, and coastal waters or introduces them into ground water." (U.S. Environmental Protection Agency)

In other words, it is pollution that enters waterways by overland flow or infiltration as opposed to through conveyances such as pipes or channels.

By the early 1970s many streams and lakes across the land had become open conduits for the nations' sewage and industrial wastes. With passage of the Federal Water Pollution Control Act of 1972 (PL92-500), Congress set in motion a massive cleanup effort. Throughout the following decades hundreds of waste treatment facilities were constructed. Previously polluted streams and lakes became cleaner and aquatic life began to reappear where it had been absent.

However, 24 years and billions of dollars later, we have not yet completely achieved the goals of water that is clean enough for swimming, recreational uses and protection of aquatic life. Only about half of today's pollutants come from pipes, often referred to as point sources. The remainder of pollution comes from nonpoint sources.

Before measures can be taken to reduce NPS pollution, a determination must be made that a water quality problem exists along with its extent and its cause. In order to do that, we must first define water quality. The following paragraphs are from the *Water Quality Field Guide* published by USDA-Natural Resources Conservation Service:

> "The first step when addressing water quality is to determine if there is a problem, and if so, its nature and magnitude. A problem occurs when there is an unfavorable condition in the receiving waters, which adversely affects a designated use of water. Some of the more common uses are for irrigation, livestock, recreation, fish and wildlife, and for domestic use. If any of these [designated] uses are impaired, there is a water quality problem.
>
> "Water quality is not easy to define. The desired level of water quality depends upon how the water will be used. Water for irrigation need not have the same [level of protection] as water for swimming or drinking. Even irrigation water quality may vary, depending on the salt tolerance of the crops to be irrigated. If, for example, irrigation water is so saline as to restrict plant growth, its use is impaired and we say the water quality is poor. It is in the context of use impairment that the term "water quality" should be used.

"A water quality problem may be highly localized (fish kill in a farm pond) or regional, national or even international in scope. The water quality problems in Lake Erie, for instance, involve the U.S. and Canada and include recreation, drinking water, and commercial fishing uses, among others. Problem identification may be as simple as a complaint to a local health board or as structured as the national planning process that took place under Section 208 of the Water Quality Act. Many of the water quality management plans developed in this process identify water quality problems and prioritize them for action.

"The following principles are important in developing a step-by-step procedure for nonpoint (diffuse) source pollution control:

1. ***For a water quality problem to exist, the water must be impaired for some [designated] use*** - drinking water supply, fishing, recreation, etc. The same body of water may have one or more totally different problems depending on its various uses. The physical, chemical, and biological characteristics of the water body [and their interrelationships] will determine the severity of the water quality problem and the potential for improvement with implementation of control measures. Naturally occurring substances, such as phosphate and nitrate, are pollutants only when their concentrations in the water are high enough to cause a water quality problem.

2. ***Once the pollutant or pollutants*** causing the water quality problem ***are identified, the roles of the pollutants*** in deteriorating water quality ***must be understood and the sources*** of the pollutants ***must be identified.***

3. ***The process by which each nonpoint source pollutant is generated and transported to the water body must be identified.*** The ***availability*** of a pollutant to be lost from the land, and its ***detachment*** and ***transport*** will depend on the physical, chemical, and biological properties of the pollutant and its reactions in soil and water. Pollutants that are strongly adsorbed by soil are susceptible to detachment and transport with the soil. Soluble materials that have a low affinity for soil particles are more susceptible to leaching losses.

4. ***For a practice to be effective in reducing diffuse sources of pollutants, it must be able to interfere with the availability, detachment, or transport of a pollutant.*** In other words, the practice must decrease the availability, prevent the detachment, or interrupt the transport process if the pollutant load is to be decreased. In selecting an appropriate practice, one must consider the relative merits of permanent practices that have high capital costs versus those that have lower capital costs but require careful continuous management by the [land manager]. Practices that solve one water quality problem must not increase the potential for another problem. Practices may be appropriate for certain types of

problems (e.g., no till for reducing soil erosion), but if that practice does not adequately control the target pollutant, then it cannot be considered the 'best management practice' for solving the existing water quality problem." (NRCS)

This document, the Missouri Nonpoint Source Management Plan, addresses how Missouri intends to improve and protect water quality impacted or threatened by NPS pollution.

REFERENCES

U.S. Department of Agriculture, Soil Conservation Service. Water Quality Field Guide, 1983. Revised 1988.

U.S. Environmental Protection Agency, Office of Water. Nonpoint Source Guidance, 1987.

U.S. Environmental Protection Agency, Office of Water. Nonpoint Source Pollution: The Nation's Largest Water Quality Problem, Pointer No. 1, EPA841-F-96-004A.